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ABSTRACT

The results of several research studies designed to evaluate different theories of work motivation are presented. Graen (1967), through hiring 169 high school girls to do a clerical task, showed that ability measures can account for far more performance variance than motivation variables such as expectancy and instrumentality. Similar results were obtained in investigations by Arvey (1970) and Loehr (1970). In the most comprehensive investigation, Pritchard, Dunnette, and Jorgenson (1972) confirmed deductions from both Equity Theory and Expectancy Theory, but their results also showed that different conditions of work incentive may facilitate or disrupt the expression of ability differences in work performance. It is argued from results of these several studies that simpler measures rather than more complicated ones need to be investigated as psychologists continue to try to account for the non-ability part of human work performance. Less emphasis should be placed on 'motivation per se and more placed on learning about the dimensional makeup of the missing term in the equation: PERFORMANCE equals ABILITY plus WHAT? (Author)

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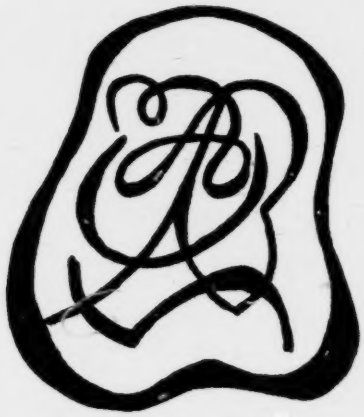

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# THE CENTER FOR THE STUDY OF ORGANIZATIONAL PERFORMANCE AND HUMAN EFFECTIVENESS

University of Minnesota
Minneapolis, Minnesota

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# Performance Equals Ability and What?

Marvin D. Dunnette

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13. ABSTRACT

This paper is a slightly revised version of a paper given by Dunnette during March, 1972, at the Universities of British Columbia and Toronto. After briefly reviewing psychologists' efforts to predict human work performance, results of several research studies designed to evaluate different theories of work motivation are presented. Graen (1967) hired high school girls to do a clerical task and showed that ability measures accounted for far more performance variance than motivational variables such as Expectancy and Instrumentality. Similar results were obtained in investigations by Arvey (1970) and Loehr (1970). In the most comprehensive investigation, Pritchard, Dunnette, and Jorgenson (1972) confirmed deductions from both Equity theory and Expectancy theory, but their results also showed that different conditions of work incentive may facilitate or disrupt the expression of ability differences in work performance. It is argued from results of these several studies that simpler measures rather than more complicated ones need to be investigated as psychologists continue to try to account for the non-ability part of human work performance. Less should be said about "motivation" per se and more done to learn about the dimensional makeup of the WHAT term in the equation:

PERFORMANCE equals ABILITY and WHAT?

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| Two Factor Theory | | | | | | |
| Equity Theory | | | | | | |
| Expectancy Theory | | | | | | |
| Goal Setting Theory | | | | | | |
| Prediction of Work Performance | | | | | | |

# PERFORMANCE EQUALS ABILITY AND WHAT?

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Since Sir Francis Galton began the systematic study of individual differences, observers and students of human behavior have been alternately gratified and mystified by their knowledge of the extent and range of human variation and its correlates. For a time, the infant science of psychology ignored these vast human differences and very nearly floundered amidst its brass instruments and chronometers, searching vainly for general principles of human behavior.

A pressing problem and the genius of Alfred Binet saved the day for psychology. Responding to the need for better methods of identifying children with poor learning aptitude, Binet analyzed the "job" of school learning. He invented standard questions and tasks which he believed would elicit response differences from children according to their different abilities to learn. He tried his materials out with school children and confirmed that many of his items did indeed elicit such differences. The publication of the first Binet Scales in the early years of this century set off a burst of world wide enthusiasm, spawned by society's eagerness to understand and to predict human differences in effectiveness and by psychologists' zest for the technology of test development.

According to Herrnstein (1971), in his widely discussed Atlantic

Monthly article:

> The measurement of intelligence is psychology's most telling accomplishment to date. Without intending to belittle other psychological ventures, it may be fairly said that nowhere else--not in psychotherapy, educational reform, or consumer research--has there arisen so potent an instrument as the objective measure of intelligence. (p. 45)

Yet, even as some of those early psychologists were sensing satisfaction and pride in the breakthrough they had wrought, examples of the insufficiency of ability alone came to be known. At first, there were the discrepancies between what some children did learn and what their IQ's predicted they should be able to learn. Later, even with the development of a plethora of additional ability and aptitude tests, initial hopes of an increasing pattern of predictive validities were shattered. By 1928, Hull already found it necessary to lament the existence of a validity plateau of .50 or .60 which apparently could not be penetrated until methods of greater sophistication were developed and implemented.

More important, quite apart from the admittedly distressing fact of a validity ceiling, psychologists were coming to realize what the man in the street had long known--namely that behavior potential was not the same as behavior volition. Industrial psychologists were moved to give attention to such notions as drives, motives, needs, and preferences as they attempted to evaluate sales "aptitude," and these efforts led ultimately to E. K. Strong's monumental life work in the area of vocational interest measurement. In fact, over the span of nearly 25 years extending from the 30's well into the 50's, Strong's

research stands almost alone as the single systematic and continuing attempt to study that most important element of volitional behavior--the choice of occupation. Yet, Strong's life work seemed not to catch the fancy of many of those who were concerned with questions of job motivation. The behavior he chose to study--job choice and job persistence--was somehow too coarse a cut, and it failed to tell us much about motivation differences among persons within particular jobs or job situations. Nonetheless, few psychologists, over those years, did much else about motivation. Oh, they did frequently call attention to its importance as they lamented the inadequacy of aptitude testing. For the most part, they seemed to assuage their discomfort about the neglect of motivation by developing and administering job satisfaction inventories. Job satisfaction came frequently to be linked with motivation, thence with job performance and ultimately to form the basis for recommending all sorts of human relations training programs. For a time, it appeared that the primary goal for the well managed organization was to have all its employees be "happy workers."

Brayfield's and Crockett's (1955) widely cited review article in 1955 put an end to all that. Chastened by this revelation of the mounting evidence against any stable relationship between job satisfaction and job performance and spurred on by Maier's dictum that Performance is a function of Ability multiplied by Motivation, industrial psychologists began to look toward other areas and, for Herzberg (Herzberg, 1966), even to the bible for helpful conceptions of industrial motivation. Over the last 15 years, four major theoretical positions have been suggested as being relevant to an understanding of industrial motivation. These are:

1) Herzberg's Two-Factor Theory
2) Various versions of Valence-Instrumentality-Expectancy (VIE) Theory
3) Locke's Goal Setting-Intentionality Theory
4) Adams' Equity or Social Comparison Theory

In reviewing the major formulations of these four theoretical positions, one's first impression is that we are being punished for our misspent youth, squandered as it was in measuring job satisfaction in all its forms. A less emotional response is merely one of confusion induced by the varieties of internal and external constructs, by the plethora of incentive conditions said to be necessary to elicit motivated or avoidance behaviors, by the great array of perceptual and behavioral responses presumed of the employee, and by the contradictory predictions made by these theories. For example:

(1) Herzberg speaks of Abraham and of Adam. He tells us not only that which we already believe--that some incentive conditions are more compelling than others --but he speaks to us also of Motivators and of Hygeines, and wouldst have us believe that satisfaction is within the province only of the motivators and that dissatisfaction abideth only with poor hygiene.

(2) Vroom would have us believe that what we choose to do is based on a careful tallying of forces--each force based on a complicated sum of preferences (Valences) multiplied by Expectancy (a subjective estimate that what we do will be followed by the outcome or outcomes

yielding the above preference values). [The outcomes, in turn, include all outcomes that are instrumental to certain other outcomes and which we have, with experience, learned are associated with those outcomes.] A kind of boggled impression as one ponders the Valence-Instrumentality-Expectancy model is that it is quite remarkable that the human mind should be capable of tallying all these forces--quite unconsciously, apparently--especially when one considers how few minds there are that can even handle the complexities sufficiently to design careful research studies of the theory.

VIE theory has its disciples, however. Not content with the simplicity of Vroom's conceptions, Porter and Lawler (1968) have added additional features such as EFFORT, REWARDS, ABILITY, SELF-ESTEEM, PERFORMANCE, and several others.

Others have seen fit to substitute some new names for Vroom's terminology. In an attempt to sort out different levels of outcome, Graen (1967) modified the model to include "work roles" instead of "task goals." Campbell, et. al. (1970), having some difficulty with the term "instrumentality," called it "Expectancy II" instead.

We should note in passing that the Vroom VIE model, in all its versions, does predict that higher performance will be associated with higher expectancy. The closer the perceived linkage between preferred outcomes and one's

anticipated behavior, the more likely is that behavior to ensue. [Note that this is quite different from Atkinson's notions which state that maximum motive force will be associated with middle level expectancies, the reason being that very easy tasks have less value (valence) for the achievement oriented person than more difficult tasks.]

(3) Locke (1968) shares with us the entirely appealing and praiseworthy thought that persons who establish goals for themselves or accept goals set by others will, indeed, work toward those goals and make every effort to attain them. Among those persons who agree to work toward goals, the ones with very difficult goals accomplish more than those with easier goals. Locke and his colleagues have produced an impressive amount of confirming evidence, all of which seems to <u>disconfirm</u> Vroom's central notion that the more certain goals (high expectancy) will yield higher performance than the less certain goals (low expectancy).

We should note, however, that goals are best made quite specific for performance to fit Locke's point of view, for the attachment of challenge and the focusing of effort toward goal attainment (girding one's loins, so to speak) is imprecise and mushy without knowing explicitly what that goal constitutes.

(4) Adams (1965) tells us that what we put into a job and what we get from it are regarded as good, equitable, or inequitable depending upon how they compare with the job arrangements of others with whom we choose to compare ourselves.

According to Adams, a person in a job develops certain notions about his Inputs to that job and his Outcomes from it. He forms a sort of Input/Outcome ratio. He has certain standards of what his own personal Input/Outcome ratio should be--either as a result of knowing about other persons with whom he actually compares himself or as a result of his knowledge of similar jobs, persons and situations from his past experience.

When one's own ratio is seen as correct, a state of equity exists, and all is happiness and light.

When, however, Inputs are seen as too great in comparison with the Outcomes, a state of UNDERREWARD Inequity is felt. A state of internal tension is established and the employee may a) reduce his Inputs; b) somehow increase his Outcomes, if not tangibly, by cognitively ("rationalizing") seeing good things in the job that he had not previously noticed.

When, on the other hand, the Outcomes are seen as too great for the Inputs, a state of OVERREWARD Inequity is felt. Then, to alleviate internal tension, an employee may a) increase his Inputs (by perhaps working harder, doing more,

or increasing his work quality); b)decrease his Outcomes (by doing less if he were paid by the piece or--more likely--changing his perception of the job and thereby deriving less satisfaction from it because he sees bad things in the job he had not previously noticed).

We must note that Equity Theory predictions may or may not contradict those made from Expectancy Theory. The two theories are quite independent of each other because of the differing systems of comparison presumed for the employee.

Perhaps the most interesting contradiction occurs in the state of OVERREWARD Inequity when employees are paid according to amount of work done. Expectancy Theory--recognizing the close link between the employee's Inputs and his Outcomes--predicts increased performance. Equity Theory, in contrast, states that the employee would seek to decrease his Outcomes; and, in piece rate payment, he should not, therefore, increase the quantity of his performance.

In 1966, faced with this new wave of theory building in industrial psychology, I decided to undertake a series of studies for the purpose of sorting out the relative contribution of various of the theorists' variables to overall variation in work performance. As a starter, several students (John Campbell, Paul Wernimont, Milton Hakel, George Graen) and I showed that the Two-Factor Theory was hopelessly tied to

Herzberg's story telling methodology (Dunnette, Campbell, & Hakel, 1967). Recognizing that the Two-Factor Theory really said little about job performance anyway, we put aside further research with it and concentrated more fully on Expectancy, Equity, and Goal Setting formulations.

I should like to review quickly the major results obtained over the last five years by students who have investigated these several theories. Though the studies did usually study job satisfaction as well as job performance, my focus here will be on job performance--with particular emphasis on the relative contributions to job performance variance made by ability and by the motivational variables suggested by the theories under study.

Graen (1967) hired 169 high school girls for two day's work during their spring vacation in 1966. Not realizing they were part of an experiment, they worked on a complicated but rather boring clerical task involving comparisons of numbers and rounding them on sheets of computer printout. By giving money rewards to some and praise-achievement-recognition rewards to others, Graen showed clearly that the girls' job experiences did affect, in a differential way, their perceptions of the instrumentality of the work role "Effective Performer" for other job outcomes--namely money for the one group; recognition-achievement for the other. Graen examined relationships between the "motivation" variables postulated by Vroom, their products (that is--Valence times Instrumentality times Expectancy), scores on a five minute clerical aptitude test, and various scores from the California Psychological Inventory and job performance. For the two groups, ability accounted for 22% and 34% respectively of the variance in performance. In a step-wise multiple regression analysis, two CPI scales--

Self-acceptance and Intellectual Efficiency--increased the variance components to 27% and 39%, respectively. Adding the motivation variables postulated by Vroom brought the variance components up to 30% and 41% respectively. Job performance for these girls was, therefore, predicted best by brief aptitude and personality measures. Motivation variables, manipulated during the experiment, contributed, at most, only 2 or 3% to the girls' overall variance in job performance.

Arvey (1970) performed a strictly laboratory investigation designed to evaluate the two types of expectancy suggested by Campbell et al in their modification of Vroom's theory. The task was adding and subtracting simple numbers. The incentive was the award of two more experimental points [to be added to their General Psychology test scores] for subjects who successfully passed two hurdles. First, they had to achieve task "success" in competition with other subjects in the experiment. Depending upon the experimental condition, subjects' chances (Expectancy I) of task success were 1 in 5 (.20), 50-50 (.50), or 3 in 4 (.75). Second, those who attained task success were allowed to "draw" for the institutional reward of the two test score points. Again, depending upon the experimental condition, subjects' chances (Expectancy II) of receiving the incentive were either 1 in 4 (.25) or 3 in 4 (.75). Arvey's results showed a statistically significant and monotonic relationship between subjects' expectancy of being among those successful in the task and task performance (measured by number of correct answers). Persons with low expectancy (.20) did least; those with high expectancy (.75) did most. Subjects' expectancies of receiving the incentive, if successful on the task, showed no relationship to performance, and no significant interaction effect of EI and EII was shown against

performance. The 111 subjects stating that they worked for a particular goal did better, though only marginally, than the 79 subjects stating they had no particular goal. In contradiction to Locke's predictions, the relationships between expectancy and performance was direct and monotonic for both goal groups.

Scores on a short numerical aptitude test, taken by these subjects two years previously while seniors in high school, were available. Various of the motivation components were correlated separately and in combination with performance. The best combination accounted for but 2% of the variance in performance. Ability alone accounted for 18% ($r=.43$) and, in combination with motivation variables (including goal acceptance and valence) in a multiple regression equation, accounted for 22%. In order to test Maier's multiplicative dictum, Arvey calculated a Derived Motivation Score for each subject from the product of Valence times Expectancy I times Expectancy II. A performance estimate was then developed by multiplying each subject's ability times his Derived Motivation Score. The correlation between estimated performance and actual performance was only .14, accounting for only 2% of the variance in performance.

These results suggest the need for modifying Maier's rule about the multiplicative effects of ability and motivation:

Performance Is a Function of Ability

and What?

Until we can tie down with greater certainty how to compute the so-called motivation term in Maier's equation, we had best leave an unknown term (What?) there and seek to discover its nature by continued empirical studies.

In a study directed toward clarifying aspects of Arvey's investigation, Loehr (1970) presented two groups of subjects with different task success directions. The first--called the Relative Goal Set--used the same directions as Arvey had used, again presenting three objective probability of success conditions of .2, .5, and .75. Using Arvey's subjects as a norm group, Loehr then determined performance levels equivalent to the 25th, 50th, and 80th percentiles. The second group received directions--called the Specific Goal Set--incorporating not only the objective probability of success but giving them the specific number of items necessary to accomplish success under each probability condition. We reasoned, of course, that the Specific Goal Set ought to be optimally suited for confirming Locke's contention that --given goal acceptance--difficult goals yield higher performance than easy goals.

Loehr's results failed to confirm Locke's goal-setting hypothesis. Results for the Specific Goal Group were the same as those obtained by Arvey using a Relative Goal Set. This time, however, nearly all (149 of 175) of our male subjects

> claimed goal acceptance. Interestingly, however, the 26 subjects who did not accept the goal performed significantly more poorly than those accepting the goal. Surprisingly, subjects in the Relative Goal Set condition--working this time for something more tangible, a $3 award, instead of test score points--showed a pattern of performance compatible with Atkinson's formulation. [That is, lowest for subjects with low subjective expectancies, highest for those with middle level expectancies, and slightly lower for those with highest expectancies.]

Loehr used scores on a five minute arithmetic test (SET-N) as a blocking variable on ability. The ability test alone accounted for 41% (r=.64) of the variance in performance. In a step-wise multiple regression analysis, goal acceptance added 7%, and valence for task accomplishment (importance) added 4% more. Thus, the three variables--ability, goal acceptance, and valence of task accomplishment--accounted together for 52% (R=.72) of the performance variance. Adding all the other motivational variables (including Valence for the $3 incentive, Effort, subjective expectancy of success, objective probability set by the experimenter, type of goal set, and a number of interaction terms) accomplished an additional increase of only 2% in the variance accounted for.

In our largest and most comprehensive study so far, Pritchard, Jorgenson, Tornow and I (Pritchard, Dunnette, and Jorgenson, 1972; Tornow, 1971) served as go-betweens for the National Science Foundation in funneling nearly $20,000 into the economy of the State of Minnesota. The willing and hard-working recipients of these funds were the 269 male college students whom we hired throughout the state to work seven half-days for us during their spring breaks in 1969. Our purpose was to learn how their job performance might vary according to ability, expectancy, and equity considerations. Their purpose, presumably, was to earn money. The design of the study was a s follows:

> 269 male students were hired during their spring break at six locations throughout Minnesota. They worked four and one-half hours per day for seven days. The "firm" they worked for was a "manpower overload company" called PERSONNEL DECISIONS, INC.

They worked on two contracts. One, the primary task was "for the Sears Company." It consisted of a complicated catalogue lookup and pricing job, working with computer output and a Sears catalogue. The task was designed so that no errors were possible. Thus, work quality was ruled out as a mode of reducing inequity.

The second "contract" was with Science Research Associates. It consisted of administering a number of questionnaires and tests "designed to see how people react to routine work.

The basic purpose was to induce perceptions of underpayment, equity, and overpayment under conditions of low expectancy between effort and pay and high expectancy between effort and pay. Thus each of the three Equity conditions was studied under hourly pay and under incentive--a modified piece rate--pay system. Thus, Low Expectancy was induced by using flat hourly pay ($2.00), and High Expectancy was induced by using an interval pay scheme:

| | |
|---|---|
| 16-22 units | $1.60 |
| 23-29 units | $2.00 |
| 30 or more | $2.40 |

Each expectancy condition was maintained for three work days. Then a company policy change was announced, and subjects worked, during the last three days, under the opposite expectancy condition.

Induction of Overreward Inequity was accomplished entirely through the subterfuge of an error having been made by the company in its advertising. No threat to the employees' qualifications was made. Instead, the action was simply a policy decision to pay "more than the going rate" because of the error that had been made in the employment ads.

The choice of the interval pay system was done in order to allow subjects in the Overreward, High Expectancy condition to increase their Inputs (work done) without experiencing a corresponding increase in their Outcomes (pay).

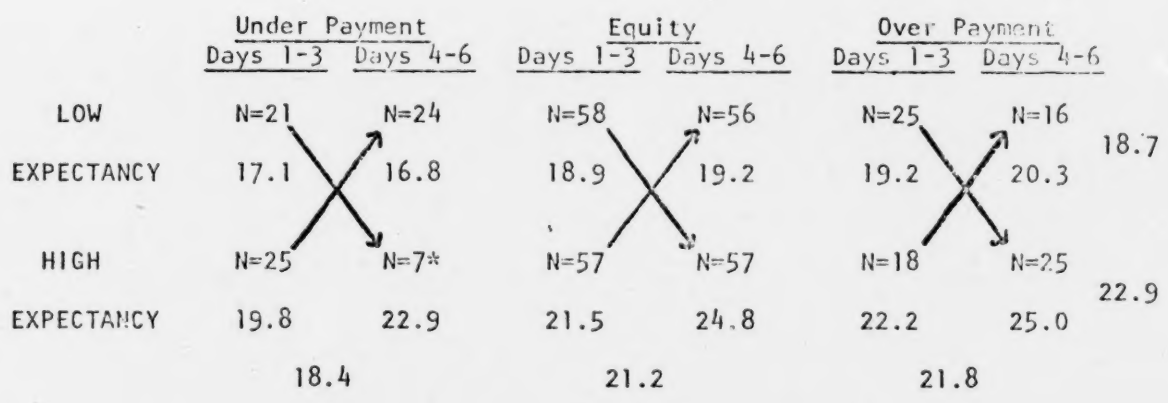
The change in work rules after three days on the job was done in order to provide a repeated measures comparison for the effects of Low and High Expectancy and to establish, for certain subjects, the possibility of naturally occurring rather than experimentally induced feelings of inequity. Thus, some workers made to feel equitably paid under High Expectancy were changed to a flat hourly rate (Low Expectancy) after three days. Those who had been high producers and high earners would presumably come to feel underrewarded. Those who had been low producers and low earners would presumably come to feel overrewarded.

The table on the following page gives an overview of the results obtained for performance. There you see the mean hourly production for subjects under each condition of equity and type of pay. The effects of the two conditions are about equal, each accounting for about 20-25% of the overall performance variance, corresponding to

EQUITY AND EXPECTANCY EFFECTS
ON JOB PERFORMANCE AND
JOB SATISFACTION

(Dunnette, Pritchard, Jorgenson,
Tornow)

MEAN HOURLY PERFORMANCE ACCORDING TO CONDITION

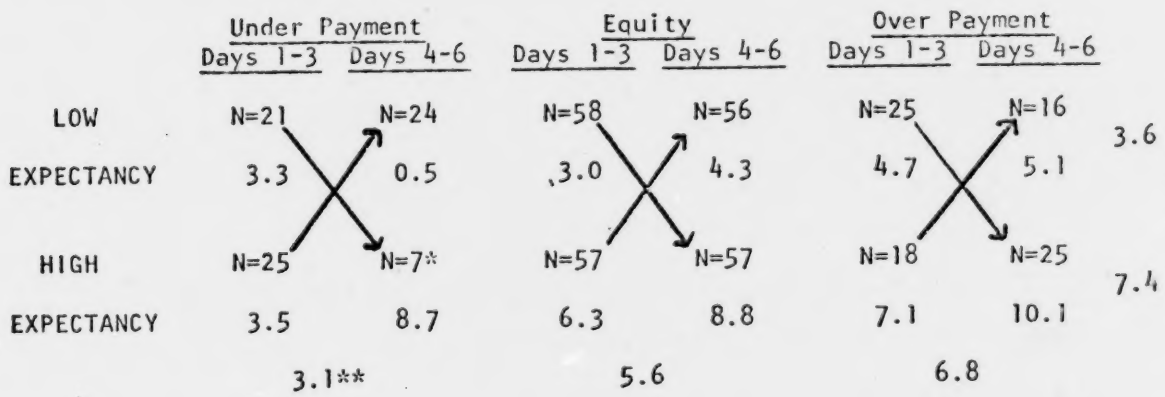



* Thirteen men walked off the job in disgust when the interval pay plan was announced.

EQUITY AND EXPECTANCY EFFECTS
ON JOB PERFORMANCE AND
JOB SATISFACTION

(Dunnette, Pritchard, Jorgenson,
Tornow)

MEAN HOURLY PERFORMANCE ABOVE PRETEST
PERFORMANCE ACCORDING TO
CONDITION




* Thirteen men walked off the job in disgust when the interval pay plan was announced.

** Weighted according to sample sizes.

correlations of .42 for Equity and .51 for the Expectancy variable.

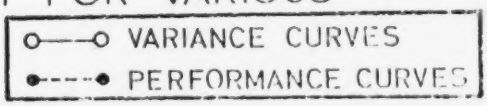
In examining the relationship between ability and job performance for these men, we used two ability measures. The first was based on the multiple correlation between three 5-minute ability tests (SET-V, CA, N) and subjects' performance on a one hour task practice session given prior to employment. The multiple correlation for the three ability tests was .71, accounting for exactly 50% of performance variance. The other ability measure was the practice performance itself. Performance on the practice task showed a median correlation of .69 against average daily performances for the various groups of subjects under different experimental conditions. The range was from .14 to .84. It is instructive to examine the patterns of performance variance associated with ability factors for different groups of subjects under conditions differing, presumably, in the nature of the motivating properties of the job setting.

The charts on the next page show the average hourly production for each group on each day of the experiment. Those charts also show variance curves, depicting how influential ability alone was in explaining the performance for each group of employees on each day of the experiment.

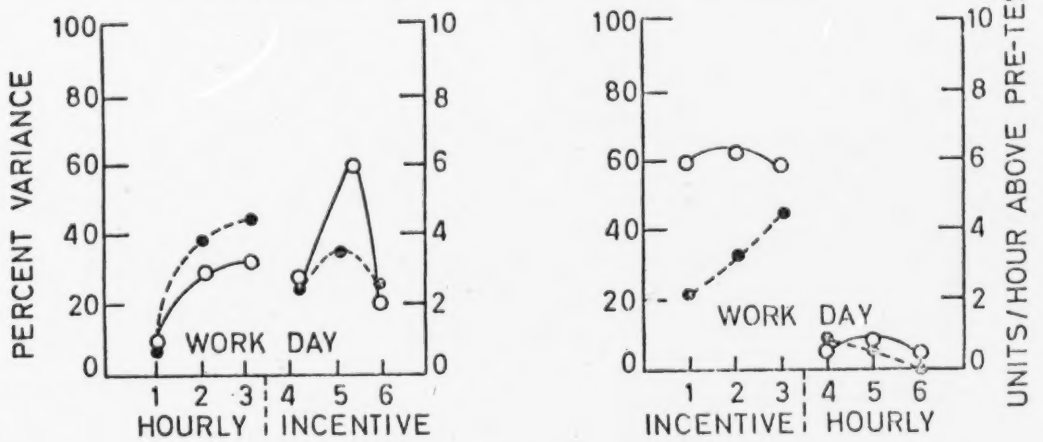
In a sense, these charts portray the degree to which our efforts to induce higher motivation or to reduce motivation were successful in disrupting the expression of individual ability differences in the form of job performance differences.

For example, take a look at the chart in the upper right hand corner. There, even though the employees were made to feel underpaid, they were still being paid,during days 1-3, in a way that they could

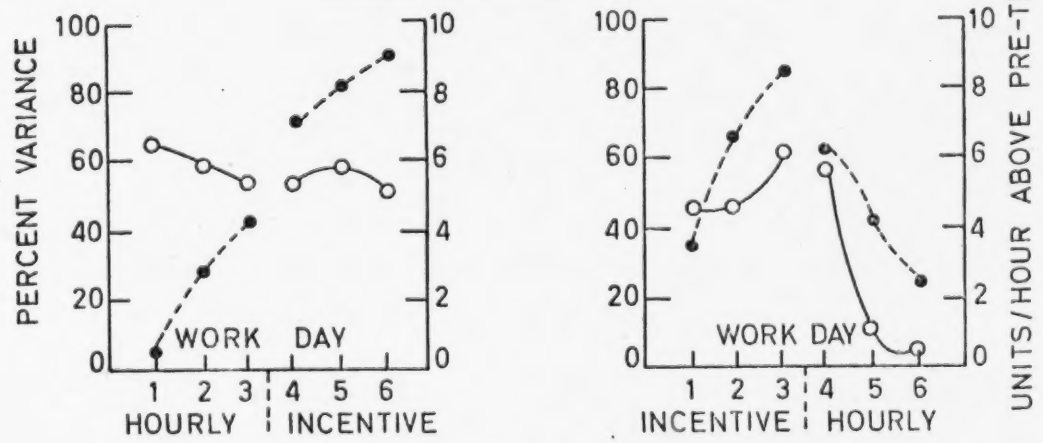
# PERFORMANCE AND PERCENT OF PERFORMANCE VARIANCE RELATED TO ABILITY FOR VARIOUS CONDITIONS



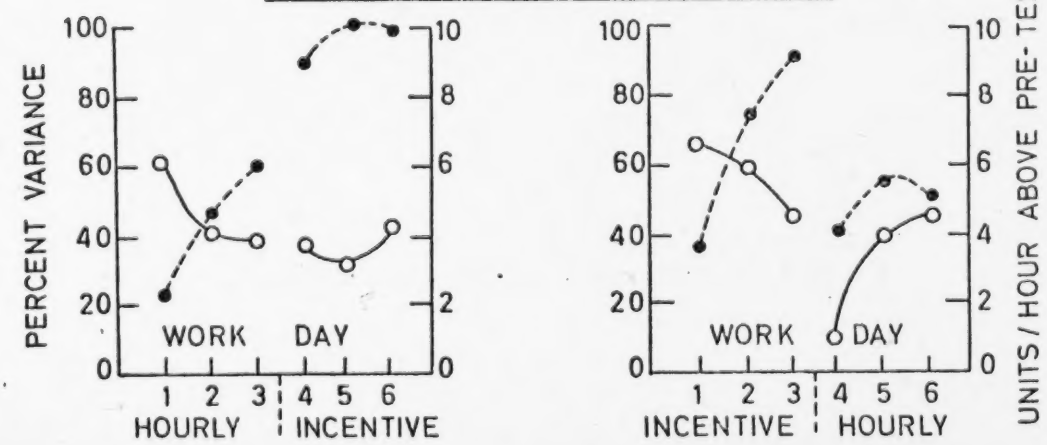

## UNDER REWARD CONDITION




## EQUITY - CONDITION




## OVER REWARD CONDITION



EQUITY AND EXPECTANCY EFFECTS
ON JOB PERFORMANCE AND
JOB SATISFACTION

(Dunnette, Pritchard, Jorgenson,
Tornow)

MEDIAN PROPORTIONS OF DAILY PERFORMANCE
VARIANCE ASSOCIATED WITH
PRETEST PERFORMANCE

| | Under Payment | | Equity | | Over Payment | |
|---|---|---|---|---|---|---|
| | Days 1-3 | Days 4-6 | Days 1-3 | Days 4-6 | Days 1-3 | Days 4-6 |
| LOW EXPECTANCY | .35 | .12 | .64 | .10 | .41 | .40 |
| HIGH EXPECTANCY | .63 | .35* | .50 | .58 | .60 | .41 |

MEDIAN PROPORTIONS OF DAILY PERFORMANCE
VARIANCE ASSOCIATED WITH REGRESSION
ON THREE ABILITY MEASURES

| | Under Payment | | Equity | | Over Payment | |
|---|---|---|---|---|---|---|
| | Days 1-3 | Days 4-6 | Days 1-3 | Days 4-6 | Days 1-3 | Days 4-6 |
| LOW EXPECTANCY | .29 | .15 | .44 | .29 | .23 | .27 |
| HIGH EXPECTANCY | .45 | .01* | .38 | .44 | .56 | .71 |

* Includes only seven men; the other 13 walked off the job in protest over the change in pay policy.

see the fruits of their work effort. Thus, for the first three days, ability correlated highly with their actual performance--.78, .80, and .79 on each of those days, and their performance showed an increasing pattern of output for the three days.

However, when they were changed to the straight hourly (Low Expectancy) pay scheme, their performance went crashing downward, and this was accompanied by the complete disruption of the expression of ability differences in the way the men were performing their work for our company.

Other findings evident from these charts include the following:

- The most "normal" employment condition--in the sense of ability being expressed most faithfully and performance showing an ever increasing pattern--occurred when employees felt fairly paid--the condition of EQUITY shown in the middle two charts.

- The most devastating effect on the expression of ability differences and the greatest decrement in performance occurred when men were changed to hourly pay after having first worked under incentive pay conditions. This is seen clearly in the three right hand charts. It is extremely interesting to note, however, that the effects of hourly pay were less serious when it was used during the first three days. The change to hourly--Low Expectancy--pay was the prime factor, not so much the mere fact of hourly pay in and of itself.

- Interestingly, the pattern of results for men in the Over-reward Condition shows that they did not reduce their

Outcomes from the job by working less under incentive pay. Yet, the expression of their ability differences in performance tends to be somewhat less, on the average, than for the men made to feel equitably paid. Examination of job satisfaction information showed that the overrewarded men were least satisfied with their jobs. In particular, they believed strongly that their abilities were being underutilized. In effect, they reduced their job Outcomes by taking a dim view of their jobs--by being dissatisfied with them, even though their pay rewards were still believed by them to be substantial. In effect, they probably came to believe that they were "prostituting" themselves for the sake of money, and they disliked the job situations responsible for putting them into such a pattern.

I conclude from these results that ability differences still are empirically the most important determiners of differences in job performance. The administrator's major purpose in trying to manipulate or alter incentive conditions becomes one of assuring the actual expression of those differences in the form of job performance, as was the case in our experiment when men were made to feel equitably rewarded, and they were reasonably certain that higher productivity on the job would indeed be rewarded with higher pay outcomes. Thus, the results suggest a way perhaps of estimating the impact of different incentive conditions on work behavior. The degree of departure of job performance variance from what would be predicted by ability differences may provide clues about the degree of involvement of motivational variables.

In this experiment, the widely assumed multiplicative relationship between ability and motivation would yield meaningless results. As motivation changes, it has direct effects on the expression of ability. Under only certain circumstances--in our study, those involving incentive pay and feelings of Equity--does it really seem that the notion of Ability times Motivation has much merit. Otherwise, the incentive conditions affect not only the motivation term in the equation, but the manner in which ability is expressed--rendering their product useless as a valid portrayal of job performance.

Taken together, results of these several studies, in addition to renewing my faith in ability as the most parsimonious basis for predicting job performance, lead to certain other recommendations :

- Simpler measures rather than more complicated ones ought to be investigated as we continue to try to account for the non-ability part of human performance. Complicated measures, in particular, those involving complex linkages between different types of Expectancy and Valence and Instrumentality have just not proven out against a criterion of seeking to explain any substantial portion of performance variance.
- The simpler measures I refer to are such direct and motivationally relevant measures as:
  - asking employees how important certain goals are to them--as individuals--not as groups;
  - asking employees whether they will or will not do something;
  - looking at the incentive characteristics of a work setting very simplistically--at first with just two

questions:

--Do employees feel equitably rewarded?

--Is the company policy such that employees do know that what they do on the job is likely to lead to things they want?

- Finally, I suggest that any further efforts to measure motivational qualities lurking inside employees, should look again toward those attributes that may reflect what the motivational behavior patterns have been in the past and in other job settings. These should lead us to focus more fully on developing new and more psychometrically sound individual differences measures of preferences, job needs, and even past behavior descriptions--instead of relying as much as we have been recently on poorly measured parameters derived from increasingly complicated "motivation" formulations and theories.

Many of you may recognize what I am recommending as a step in the direction of saying less about the label "motivation" in research we do and more about the What--the unknown term that needs still be be supplied in the equation:

Performance equals Ability and What??

## Addendum

In the work setting, my conclusions lead to the following recommendations:

(1) An employer's major goal, quite simply, should be to do everything he can to assure ("allow") each employee to give full expression to his abilities, skills, and aptitudes. This means, in turn, that:

(a) aptitudes should be measured;

(b) employees should be asked what they believe they can do (an employee's perception of his abilities and skills may often be as important as their actual measurement);

(c) employers should be sure that expectancy conditions are such as to establish a contingency of some kind (greater than zero) between employee effort and various outcomes (other "outcomes" than pay are possible); and,

(d) employers should seek to develop other individual differences measures such as opinions, preferences, descriptions of past history that may be directly related to performance differences.

(2) Employers should do whatever is possible in the form of vocational guidance, job design (enrichment), goal setting discussions, and provision of feedback about performance (to enhance among other things feelings of equitable treatment) to assure that each employee perceives that he is using his own abilities to some good end.

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